Archives of Biochemistry and Biophysics

VOLUME 268

1989

ACADEMIC PRESS, INC.
Harcourt Brace Jovanovich, Publishers
San Diego New York Boston
London Sydney Tokyo Toronto

Copyright © 1989 by Academic Press, Inc.
All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (27 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U. S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1989 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0003-9861/89 $3.00

MADE IN THE UNITED STATES OF AMERICA

CONTENTS OF VOLUME 268

NUMBER 1, JANUARY 1989

INVITED PAPER

The Multicatalytic Proteinase of Mammalian Cells *A. Jennifer Rivett* 1

COMMUNICATIONS

Adriamycin-Dependent Release of Iron from Microsomal Membranes *Giorgio Minotti* 398

Three Types of Cytoplasmic Ca^{2+} Oscillations in Stimulated Pancreatic β-Cells *Eva Grapengiesser, Erik Gylfe, and Bo Hellman* 404

BIOLOGICAL OXIDATIONS AND BIOENERGETICS

Interactions of Oxaloacetate with *Escherichia coli* Fumarate Reductase *Brian A. C. Ackrell, Bruce Cochran, and Gary Cecchini* 26

Three Different Types of Catalases in *Klebsiella pneumoniae* *Iris Goldberg and Ayala Hochman* 124

Dioxathiadiaza-heteropentalenes Mediate Superoxide and Hydrogen Peroxide Production in *Escherichia coli* *Maki Takahashi, Tetsuo Nagano, and Masaaki Hirobe* 137

The Response of Individual Polypeptides of the Mammalian Respiratory Chain to Thyroid Hormone *Ann Mutvei and B. Dean Nelson* 215

Increase in Crosslinking of Nonenzymatically Glycosylated Collagen Induced by Products of Lipid Peroxidation *Mark Hicks, Leigh Delbridge, Dennis K. Yue, and Tom S. Reeve* 249

ENZYME MECHANISMS AND METABOLISM AND COENZYMES

Chemical Modification of Iron- and Manganese-Containing Superoxide Dismutases from *Escherichia coli* *C. L. Borders, Jr., Pamela J. Horton, and Wayne F. Beyer, Jr.* 74

Investigation of the Substrate Structure and Metal Cofactor Requirements of the Rat Liver Mitochondrial ATP Synthase/ATPase Complex *Susan Hanley-Trawick, Mary E. Carpen, Debra Dunaway-Mariano, Peter L. Pedersen, and Joanne Hullihen* 116

Two Mechanisms of Spermidine/Spermine N^1-Acetyltransferase Induction *Isao Matsui-Yuasa, Shuzo Otani, Kazuhiko Yukioka, Hitoshi Goto, and Seiji Morisawa* 209

Effect of Redox Potential on the Activation of the NAD-Dependent Hydrogenase from *Alcaligenes eutrophus* Z1 *Rem R. Petrov, Iliya B. Utkin, and Vladimir O. Popov* 287

Redox-Dependent Inactivation of the NAD-Dependent Hydrogenase from *Alcaligenes eutrophus* Z1 *Rem R. Petrov, Iliya B. Utkin, and Vladimir O. Popov* 298

Effect of Redox Potential on the Catalytic Properties of the NAD-Dependent Hydrogenase from *Alcaligenes eutrophus* Z1 *Rem R. Petrov, Iliya B. Utkin, Roberto Munilla, Victor M. Fernandez, and Vladimir O. Popov* 306

Asparagine Catabolism in Rat Liver Mitochondria *David A. Moraga-A, Kathleen M. MacPhee-Quiggley, James F. Keefer, and Sheldon M. Schuster* 314

Isolation of a *Staphylococcus aureus* β-Lactamase–Dicloxacillin Complex and Kinetic Studies on the Reactivation of the Enzyme
Larry W. Hardy and Jack F. Kirsch 338

GLYCOPROTEINS AND GLYCOLIPIDS

Menstrual Cycle-Associated Alteration of Sulfogalactosylceramide in Human Uterine Endometrium: Possible Induction of Glycolipid Sulfation by Sex Steroid Hormones *Kaneyuki Kubushiro, Kyoko Kojima, Mikio Mikami, Shiro Nozawa, Rihachi Iizuka, Masao Iwamori, and Yoshitaka Nagai* 129
Production of [^{3}H]Hexosamine-Labeled Proteoglycans by Cultures of Normal and Diabetic Skin Fibroblasts: Dilution of Exogenous [^{3}H]Glucosamine by Endogenous Hexosamine from Glucose and Other Sources
Cynthia A. Silbert, Mary E. Palmer, Donald E. Humphries, and Jeremiah E. Silbert 393

HORMONE STRUCTURE AND FUNCTION

DNA Binding Property of Vitamin D_3 Receptors Associated with 26,26,26,27,27,27-Hexafluoro-1,25-dihydroxyvitamin D_3 *Masaaki Inaba, Senji Okuno, Akira Inoue, Yoshiki Nishizawa, Hirotoshi Morii, and Hector F. DeLuca* 35
Androgen Receptor in Rat Liver: Characterization and Separation from a Male-Specific Estrogen-Binding Protein
Patricia K. Eagon, Sandra M. Seguiti, Brian J. Rogerson, Terence F. McGuire, Lynne E. Porter, and Daniel H. Seeley 161

MEMBRANE TRANSPORT AND INTRACELLULAR SIGNALS

Inhibition of Na^+-Dependent Phosphate Transport by Group-Specific Covalent Reagents in Rat Kidney Brush Border Membrane Vesicles. Evidence for the Involvement of Tyrosine and Sulfhydryl Groups on the Interior of the Membrane
Raymond D. Pratt and Peter L. Pedersen 9
Specific Stimulation of Heart Sarcolemmal Ca^{2+}/Mg^{2+} ATPase by Concanavalin A
Dayuan Zhao, Naoki Makino, and Naranjan S. Dhalla 40
Heart Mitochondrial Creatine Kinase Revisited: The Outer Mitochondrial Membrane Is Not Important for Coupling of Phosphocreatine Production to Oxidative Phosphorylation *Andrey V. Kuznetsov, Zaza A. Khuchua, Elena V. Vassil'eva, Natalia V. Medved'eva, and Valdur A. Saks* 176
Ethanol Causes Decreased Partitioning into Biological Membranes without Changes in Lipid Order
Yusheng Nie, Christopher D. Stubbs, Brian W. Williams, and Emanuel Rubin 349

MEMBRANES, CELL SURFACES, AND RECEPTORS

Characteristics of an Adenosine A_1 Binding Site in Human Placental Membranes
Carolyn Work, Kevin Hutchison, Madhu Prasad, Robert F. Bruns, and Irving H. Fox 191
Phenylarsine Oxide Stimulates Hexose Transport in 3T3-L1 Adipocytes by a Mechanism Other than an Increase in Surface Transporters
Gwyn W. Gould, Gustav E. Lienhard, Laura I. Tanner, and E. Michael Gibbs 264
Purification and Characterization of Human Lysosomal Membrane Glycoproteins
Shrikant M. Mane, Louis Marzella, Dorothy F. Bainton, Valerie K. Holt, Ying Cha, James E. K. Hildreth, and J. Thomas August 360

MOLECULAR BIOLOGY, GENE EXPRESSION, AND DEVELOPMENTAL BIOCHEMISTRY

Modulation of Glycoprotein Hormone α-Subunit Levels, Alkaline Phosphatase Activity, and DNA Replication by Antimetabolites in HeLa Cultures
G. Stanley Cox and Kyung-Hae Cho Park 49

Polyamine Stimulation of Ribosomal Synthesis and Activity in a Polyamine-Dependent Mutant of *Escherichia coli*
Keiko Kashiwagi, Yuko Sakai, and Kazuei Igarashi 379

Polypeptide Composition and an Immunological Analysis of DNA Methyltransferases from Different Species *G. P. Pfeifer, L. Kohlmaier, A. Tomassetti, R. Schleicher, H. Follmann, A. Pfohl-Leszkowicz, G. Dirheimer, and D. Drahovsky* 388

OXYGENASES, MICROSOMES, AND P450 REACTIONS

Selective Induction of Heme Oxygenase-1 Isozyme in Rat Testis by Human Chorionic Gonadotropin *R. Krishnan Kutty and Mahin D. Maines* 100

Isolation and Characterization of Human Fetal Liver Cytochrome P450HLp2: A Third Member of the P450III Gene Family
Steven A. Wrighton and Mark Vandenbranden 144

Methoxyflurane Acts at the Substrate Binding Site of Cytochrome P450 LM_2 to Induce a Dependence on Cytochrome b_5 *James J. Lipka and Lucy A. Waskell* 152

Purification and Characterization of Hepatic Steroid Hydroxylases from Untreated Rainbow Trout
C. L. Miranda, J.-L. Wang, M. C. Henderson, and D. R. Buhler 227

PHYSICAL BIOCHEMISTRY, MACROMOLECULAR STRUCTURE AND FUNCTION

Evaluation of Equilibrium Constants from Precipitin Curves: Interaction of α-Crystallin with an Elicited Monoclonal Antibody
Donald J. Winzor, Arthur Stevens, and Robert C. Augusteyn 221

PLANT MOLECULAR BIOLOGY, BIOCHEMISTRY, AND PHOTOSYNTHESIS

Adenosine Triphosphate Hydrolysis by Purified Rubisco Activase
Simon P. Robinson and Archie R. Portis, Jr. 93

PROTEIN STRUCTURE AND FUNCTION

Effect of Potassium Ion on the Phosphorus-31 Nuclear Magnetic Resonance Spectrum of the Pyridoxal 5′-Phosphate Cofactor of *Escherichia coli* D-Serine Dehydratase *Christopher L. Kojiro, Michelle Marceau, and Jules A. Shafer* 67

Disulfide and Secondary Structures of Recombinant Human Granulocyte Colony Stimulating Factor
Hsieng S. Lu, Thomas C. Boone, Lawrence M. Souza, and Por-Hsiung Lai 81

Binding of Ions and Hydrophobic Probes to α-Lactalbumin and κ-Casein as Determined by Analytical Affinity Chromatography
Richard J. Fitzgerald and Harold E. Swaisgood 239

Dimer-Tetramer Equilibrium of Glutathione Reductase from the Cyanobacterium *Spirulina maxima* *Juan L. Rendón and Guillermo Mendoza-Hernández* 255

Purification and Properties of Soluble Hydrogenase from the Cyanobacterium *Anabaena cylindrica* *Gary D. Ewart and Geoffrey D. Smith* 327

PROTEIN TURNOVER, PROTEOLYSIS, AND POST-TRANSLATIONAL PROCESSING

Fish Muscle Cytoskeletal Network: Its Spatial Organization and Its Degradation by an Endogenous Serine Proteinase
Liliana Busconi, Eduardo J. E. Folco, Celina B. Martone, Raúl E. Trucco, and Jorge J. Sanchez 203

Deamidation of Calmodulin at Neutral and Alkaline pH: Quantitative Relationships between Ammonia Loss and the Susceptibility of Calmodulin to Modification by Protein Carboxyl Methyltransferase
Brett A. Johnson, Jill M. Shirokawa, and Dana W. Aswad 276

REGULATION OF METABOLISM AND OF ENZYME ACTION

N-Acetyltransferase Activity and Indole Contents of the Male Syrian Hamster Harderian Gland: Changes during the Light:Dark Cycle
Armando Menendez-Pelaez, Russel J. Reiter, Aldo Gonzalez-Brito, and Kimberly A. Howes 20

Uridine-5′-phosphate Synthase: Evidence for Substrate Cycling Involving This Bifunctional Protein
Thomas W. Traut 108

NUMBER 2, FEBRUARY 1, 1989

INVITED PAPER

Dihydrolipoamide Dehydrogenase: Functional Similarities and Divergent Evolution of the Pyridine Nucleotide–Disulfide Oxidoreductases
Donna J. Carothers, Gabriel Pons, and Mulchand S. Patel 409

COMMUNICATION

The Iron–Sulfur Protein Is Necessary for the Complete Assembly of the Low-Molecular-Weight Subunits into the Cytochrome b–c_1 Complex of Yeast Mitochondria
Shanker Japa and Diana S. Beattie 716

BIOLOGICAL OXIDATIONS AND BIOENERGETICS

Lipid Peroxidation Inhibitory Factors in Liver and Muscle of Rat, Mouse, and Chicken
Michael E. Murphy and James P. Kehrer 585

Mutational Replacements of Conserved Amino Acid Residues in the α Subunit Change the Catalytic Properties of *Escherichia coli* F_1-ATPase
Satoshi Soga, Takato Noumi, Michiyasu Takeyama, Masatomo Maeda, and Masamitsu Futai 643

The Effect of Equisetin on Energy-Linked Reactions in *Rhodospirillum rubrum* Chromatophores
Pål Nyrén and Åke Strid 659

ENZYME MECHANISMS AND METABOLISM AND COENZYMES

Activation of Pro-urokinase by Plasmin: Non-Michaelian Kinetics Indicates a Mechanism of Negative Cooperativity
M. F. Scully, V. Ellis, Y. Watahiki, and V. V. Kakkar 438

2-Ketoacid Dehydrogenase Complexes of *Escherichia coli:* Stereospecificities of the Three Components for (*R*)-Lipoate *Yuh-Shyong Yang and Perry A. Frey* 465
The Kinetic Assembly of the Intrinsic Bovine Factor X Activation System *John M. Beals, Bakshy A. K. Chibber, and Francis J. Castellino* 485

GLYCOPROTEINS AND GLYCOLIPIDS

Rat Aglycotransferrin and Human Monoglycotransferrin: Production and Metabolic Properties *Erwin Regoeczi, Maria Bolyos, and Paul A. Chindemi* 637

LIPIDS AND LIPID MEDIATORS: METABOLISM, REGULATION, AND FUNCTION

Lipoxygenase Metabolism of Polyunsaturated Fatty Acids in Oocytes of the Frog *Xenopus laevis* *Dan J. Hawkins and Alan R. Brash* 447
Stimulation of Phosphatidylinositol 4,5-Bisphosphate Phospholipase C Activity by Phosphatidic Acid *Suzanne Jackowski and Charles O. Rock* 516
The *de Novo* Synthesis of Molecular Species of Phosphatidylinositol from Endogenously Labeled CDP Diacylglycerol in Alveolar Macrophage Microsomes *Yasuhito Nakagawa, Bernd Rüstow, Harald Rabe, Dietrich Kunze, and Keizo Waku* 559
Dihydroxyacetone Phosphate Acyltransferase and Alkyldihydroxyacetone Phosphate Synthase Activities in Rat Liver Subcellular Fractions and Human Skin Fibroblasts *Harmeet Singh, Sylvia Usher, and Alf Poulos* 676

MEMBRANE TRANSPORT AND INTRACELLULAR SIGNALS

Epidermal Growth Factor (EGF) and Monoclonal Antibody to Cell Surface EGF Receptor Bind to the Same Chromatin Receptor *Ewa M. Rakowicz-Szulczynska, Donata Otwiaska, Ulrich Rodeck, and Hilary Koprowski* 456
ATP-Dependent Ca^{2+} Transport in the Rat Parotid Basolateral Plasma Membrane Is Regulated by Calmodulin *Indu S. Ambudkar, Valerie J. Horn, and Bruce J. Baum* 576
Measurement of Ca Channel Activity of Isolated Adult Rat Heart Cells Using ^{54}Mn *Robert A. Haworth, Atilla B. Goknur, and Herbert A. Berkoff* 594

MEMBRANES, CELL SURFACES, AND RECEPTORS

Adsorptive Endocytosis of Lysosomal Enzymes by Human Fibroblasts: Presence of Two Different Functional Systems That Deliver an Acid Hydrolase to Lysosomes *Alfonso González-Noriega, Rocio Coutiño, Victor M. Saavedra, and Raul Barrera* 649
Solubilization of a Guanine Nucleotide-Sensitive Form of Vasopressin V_2 Receptors from Porcine Kidney *N. Aiyar, W. Valinski, P. Nambi, M. Minnich, F. L. Stassen, and S. T. Crooke* 698

MOLECULAR BIOLOGY, GENE EXPRESSION, AND DEVELOPMENTAL BIOCHEMISTRY

Characterization of Rat Heart Tropoelastin *Celeste B. Rich and Judith Ann Foster* 551

OXYGENASES, MICROSOMES, AND *P*-450 REACTIONS

The Temporal Relationships between P450E Protein Content, Catalytic Activity, and mRNA Levels in the Teleost *Fundulus heteroclitus* following Treatment with β-Naphthoflavone *Pamela J. Kloepper-Sams and John J. Stegeman* 525

Cytochrome P450 in Livers of Diabetic Rats: Regulation by Growth Hormone and Insulin
Yasushi Yamazoe, Norie Murayama, Miki Shimada, Kiyomi Yamauchi, and Ryuichi Kato 567

Redox Cycling of Resorufin Catalyzed by Rat Liver Microsomal NADPH–Cytochrome P450 Reductase
David R. Dutton, Gregory A. Reed, and Andrew Parkinson 605

Reduction of 7-Alkoxyresorufins by NADPH–Cytochrome P450 Reductase and Its Differential Effects on Their O-Dealkylation by Rat Liver Microsomal Cytochrome P450
David R. Dutton and Andrew Parkinson 617

PHYSICAL BIOCHEMISTRY, MACROMOLECULAR STRUCTURE AND FUNCTION

Thermal Denaturation Profiles of Deoxypolynucleotide–Ligand Complexes: Semiempirical Studies
A. T. Rodriguez, B. A. Fernandez, and F. Montero 426

PLANT MOLECULAR BIOLOGY, BIOCHEMISTRY, AND PHOTOSYNTHESIS

Partial Purification of the Acyl-CoA Elongase of *Allium porrum* Leaves
Jean-Jacques Bessoule, Rene Lessire, and Claude Cassagne 475

Coregulation of Electron Transport and Benson–Calvin Cycle Activity in Isolated Isolated Spinach Chloroplasts: Studies on Glycerate 3-Phosphate Reduction
Christine H. Foyer, Robert T. Furbank, and David A. Walker 687

Immunological Approach to the Regulation of Nitrate Reductase in *Monoraphidium braunii* *Jesús Díez and Antonio López-Ruiz* 707

PROTEIN STRUCTURE AND FUNCTION

Topographic Studies of Microsomal and Pure Prostaglandin H Synthase
Richard J. Kulmacz and Kenneth K. Wu 502

Fluorescence Energy Transfer Detects Changes in Fibronectin Structure upon Surface Binding *Carl Wolff and Ching-San Lai* 536

Studies of Histidine Phosphorylation by a Nuclear Protein Histidine Kinase Show That Histidine-75 in Histone H4 Is Masked in Nucleosome Core Particles and in Chromatin *Ying-Fei Wei, James E. Morgan, and Harry R. Matthews* 546

Amino-Terminal Sequence Analysis of Rat Heart and Muscle Glycogen Synthase: Homology to the Rabbit Enzyme and the Implications for Hormonal Control
Stephen R. Jaspers, Jill Rulfs, Gary L. Johnson, John E. Mole, and Thomas B. Miller, Jr. 630

REGULATION OF METABOLISM AND OF ENZYME ACTION

Nitrogen Metabolism in Tumor Bearing Mice
Javier Márquez, Francisca Sánchez-Jiménez, Miguel Angel Medina, Ana R. Quesada, and Ignacio Núñez de Castro 667

AUTHOR INDEX FOR VOLUME 268 721

The Subject Index for Volume 268 will appear in the December 1989 issue as part of a cumulative index for the year 1989.

ANNOUNCEMENT

Walter J. Johnson Prize

For the Encouragement of Postdoctoral Research

The Board of Directors of Harcourt Brace Jovanovich, Inc., has established the Walter J. Johnson Prize to be awarded to a deserving individual or individuals having recently completed doctoral studies in the life sciences. The award was established in recognition of Mr. Walter J. Johnson, founder of Academic Press (a division of Harcourt Brace Jovanovich), who has engaged in a lifelong dedication to excellence in scientific publishing. The editorial administrators of three Academic Press journals have been vested with the authority to select the recipients of the Walter J. Johnson Annual Prize: *Archives of Biochemistry and Biophysics*, *Experimental Cell Research*, and *Journal of Molecular Biology*.

A prize of $10,000 will be awarded by the Editorial Committee of *Archives of Biochemistry and Biophysics* every three years (next in the spring of 1990) to one or more individuals who have recently completed their doctoral studies in the life sciences.

The following guidelines will apply in the selection of recipients of this award:

1. The nomination should be based on the quality of a paper published in *Archives of Biochemistry and Biophysics* during the preceding three years. The nominee must have been the first-listed author.
2. The nominee should have received his/her Ph.D. or M.D. no more than five years prior to the publication date of the article.
3. The Prize may be awarded to one nominee or divided among several nominees.
4. Nominations should be made in writing to the Chairman of the Editorial Committee by a member of the Editorial Board of *Archives of Biochemistry and Biophysics*. Nominations must be submitted by December 31, 1989.
5. Selection will be made by a Committee of Executive Editors of *Archives of Biochemistry and Biophysics*.
6. Awards will be presented next in the spring of 1990 during the dinner meeting of the Editorial Board of *Archives of Biochemistry and Biophysics* held during the Annual Meeting of the ASBMB.

Copyright © 1989 by Academic Press, Inc.
All rights of reproduction in any form reserved.

Digitized by the Internet Archive
in 2026

https://archive.org/details/archives-of-biochemistry-and-biophysics_1989_268_contents

Instructions to Authors[1]

Archives of Biochemistry and Biophysics is an international journal dedicated to the dissemination of fundamental knowledge in all areas of biochemistry and biophysics. **Short Communications** and **regular manuscripts** that contain new and significant information of general interest to workers in these fields are welcome. Sufficient detail must be included to enable others to repeat the work.

Short Communications offer a means of early publication of work of such importance that rapid publication is warranted. They should not exceed 15 double-spaced typed manuscript pages in length (including text, bibliography, tables, and figures). To expedite review and processing of communications, authors may send them directly to an Executive Editor most closely associated with the subject category of the communication. Communications sent to the Editorial Offices of the journal (see below) will be assigned to an Executive Editor.

Manuscripts should be written in clear, concise, and grammatical English and should be submitted in quadruplicate (one original and three photocopies), including four sets of original figures or good quality glossy prints, to:

Archives of Biochemistry and Biophysics
Editorial Office
Seventh Floor
1250 Sixth Avenue
San Diego, California 92101

Failure to receive the required number of copies of the manuscript may delay review. All copies of halftone artwork *must* be glossy prints or originals; photocopies of halftones do not show sufficient detail to be used for the review process. *In the case of rejected manuscripts only one copy of the manuscript will be returned to the author.*

Gene sequences should be simultaneously submitted to a gene databank. Authors of papers describing new structure determinations are requested to submit to the Protein Data Bank all of the structural data required to validate the discussion, including both x-ray amplitudes and phases and the advised atomic coordinates.

Original papers only will be considered. ***Manuscripts are accepted for review with the understanding that the same work has not been published, that it is not under consideration for publication elsewhere, and that its submission for publication has been approved by all of the authors and by the institution where the work was carried out. It is the responsibility of the corresponding author to obtain the agreement of all the coauthors of the manuscript prior to its submission to the journal.*** Abstracts of oral or poster presentations are not considered to constitute previous publication. Presentation of material in preliminary communications normally will not preclude publication of a full paper in *Archives*, provided that the full paper contains additional information that justifies its publication and does not repeat the presentation of the same data that supported the preliminary communication. The manuscript should be accompanied by copies of all preliminary communications and of all relevant manuscripts that are in press or under editorial consideration by another journal. Authors must verify the wording of any cited personal communication with the persons who supplied the information and obtain approval for the use of their names in connection with the quoted information or for the citation of unpublished work; written evidence of such approval should accompany the manuscript. All material published in *Archives* represents the opinions of the authors and should not be construed to reflect the opinions of the Editors or the Publisher.

Authors should suggest competent reviewers in their field and may also suggest individuals whom they wish to have excluded from the review process. The corresponding author will receive a decision letter from the Executive Editor. Revised manuscripts and correspondence concerning such manuscripts should be sent to the Executive Editor at the address indicated on the decision letter. Revised manuscripts should be accompanied by a copy of the unrevised version.

Many acceptable papers require minor revision or condensation. It is in the mutual interest of both the authors and the journal that amended manuscripts be returned promptly. A revised paper will retain its original date of receipt only if it is received by the Executive Editor within 2 months of the date of return to the author.

Authors submitting a manuscript do so on the understanding that if it is accepted for publication, copyright in the article, including the right to reproduce the article in all forms and media, shall be assigned exclusively to the Publisher. The Publisher will not refuse any reasonable request by the author for permission to reproduce any of his or her contributions to the journal.

Communications offer a means of early publication of work of such importance that rapid release is warranted. Normally they should not exceed 15 manuscript pages in length (including text, bibliography, tables, and figures). The review and printing of such papers will be expedited to provide earliest possible publication.

Form of Manuscript. Manuscripts should be typewritten and double-spaced throughout on one side of 8.5 × 11-in. white paper, with 1-in. margins on all sides. All pages should be numbered consecutively.

---

[1] An extended Instructions to Authors is published in the January issue of *Archives of Biochemistry and Biophysics*. Reprints are available from the Editorial Office upon request. Authors should consult the extended Instructions for details on nomenclature, IUPAC–IUB rules and recommendations, and accepted abbreviations.

Subject Areas. Authors should specify on page 1 of the manuscript the Subject Area of the article submitted. See the back cover for the listing of the Subject Areas.

Page 1 should contain the article title, author(s), affiliation(s), a short running title (abbreviated form of title) of less than 65 characters including letters and spaces, the appropriate subject category for listing in the Table of Contents, suggestions for index list entries, and the name and complete mailing address (and telephone number if possible) of the person to whom correspondence should be sent.

Page 2 should contain a short abstract of 50–250 words.

Editorial style should conform to the *Handbook for Authors* (American Chemical Society).

Footnotes to the text should be identified by superscript Arabic numerals and should be typed double-spaced on a separate sheet: footnotes to tables should be identified by superscript lowercase italic letters (^{a,b}, etc.) and placed at the bottom of the table.

Tables should be numbered with Roman numerals and cited consecutively in the text. Each table should be titled and typed double-spaced on a separate sheet. Units must be clearly indicated for each of the entries in the table.

Authors can submit complex tables and mathematical material as camera-ready copy. In this way, they are spared multiple, tedious proofreadings and the chance of error is reduced. Tables submitted as camera-ready copy should be typed single-spaced whenever possible and preferably submitted as 5×7-in. glossy prints.

Figures should be cited consecutively in the text by Arabic numerals. Legends should be typed double-spaced on a separate sheet. All figures and illustrations are to be submitted in such form as to permit photographic reproduction without retouching or redrawing. They should be planned to fit the proportion of the printed page (5.5×8 in.; column width, 2.6 in.) and submitted no larger than 8.5×11 in. Lettering on drawings should be of professional quality or generated by *high-resolution* computer graphics and should be large enough (10–12 points) to take a reduction of 50–60%. Drawings should be made with India ink on tracing linen, smooth surface white paper, or Bristol board. Alternatively, *high-quality* computer graphics may be acceptable. Graph paper, if used, should be ruled in blue. Glossy prints of figures properly prepared are acceptable. Illustrations in color can be accepted only if the authors defray the cost.

References should be cited in the text by an Arabic numeral in parentheses and listed at the end of the paper in numerical order typed double-spaced on a separate sheet. Abbreviations of journal titles should conform to those of *Chemical Abstracts Service Source Index*, 1985. Please note the following examples.

1. Kiss, Z., Deli, E., and Kuo, J. F. (1988) *Arch. Biochem. Biophys.* **265,** 38–42.
2. Stein, W. D. (1986) Transport and Diffusion across Cell Membranes, Academic Press, San Diego, CA.
3. Magnani, J. L., Spitalnik, S. L., and Ginsburg, V. (1987) *in* Methods in Enzymology (Ginsburg, V., Ed.), Vol. 138, pp. 195–207, Academic Press, San Diego, CA.

Miniprint supplements are an effective way of presenting supportive data. They are printed from plates made by photographic reduction from typed pages provided by the author. Types of data that have been published as miniprint supplements include analyses relevant to studies of amino acid or polynucleotide sequences, details of chemical syntheses, preparation of enzymes, extended statistical or mathematical discussions, and X-ray diffraction data. The miniprint supplement is published in the journal, immediately following the parent paper, and is included in the reprints. Since the miniprint supplement is produced from camera-ready copy supplied by the authors with no redaction or editorial changes it is important that the copy be letter perfect and conform to the style of the journal. *Authors will not be permitted to make changes to the miniprint supplement at the proof stage. Any changes necessary in the proof must be made as a typeset "Note added in proof."*

Proofs will be sent to the author, with a reprint order form. Authors will be charged for extensive alterations.

Reprints. Fifty reprints of each article will be provided free of charge. Additional reprints may be purchased.